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THE INLAND ARCHITECT AND NEWS RECORD

Entered at the Postoffice at Chicago as second-class matter, June 1, 1905.

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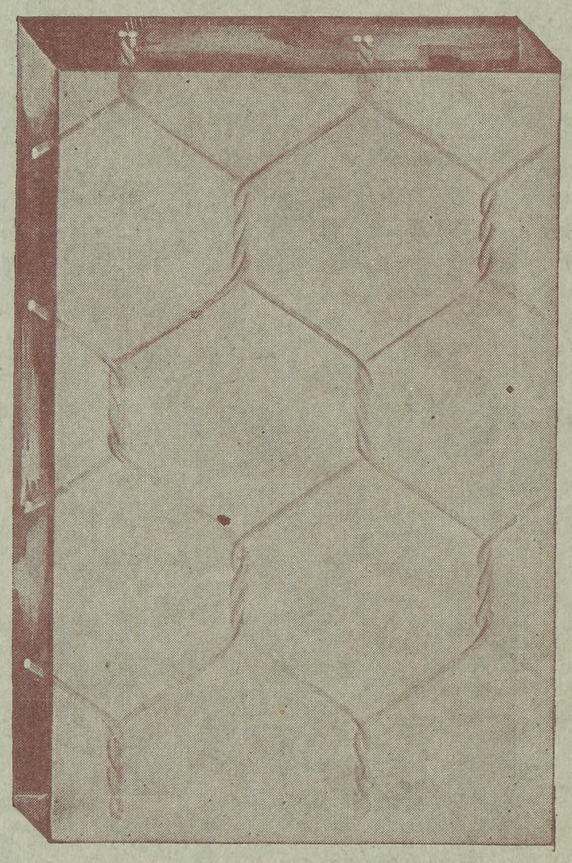

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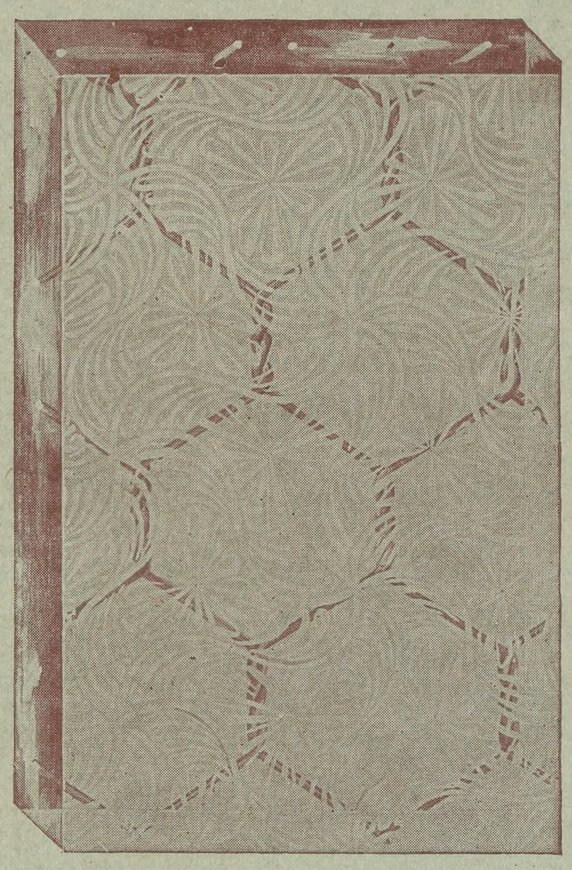

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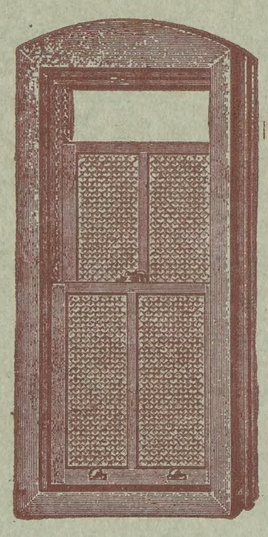

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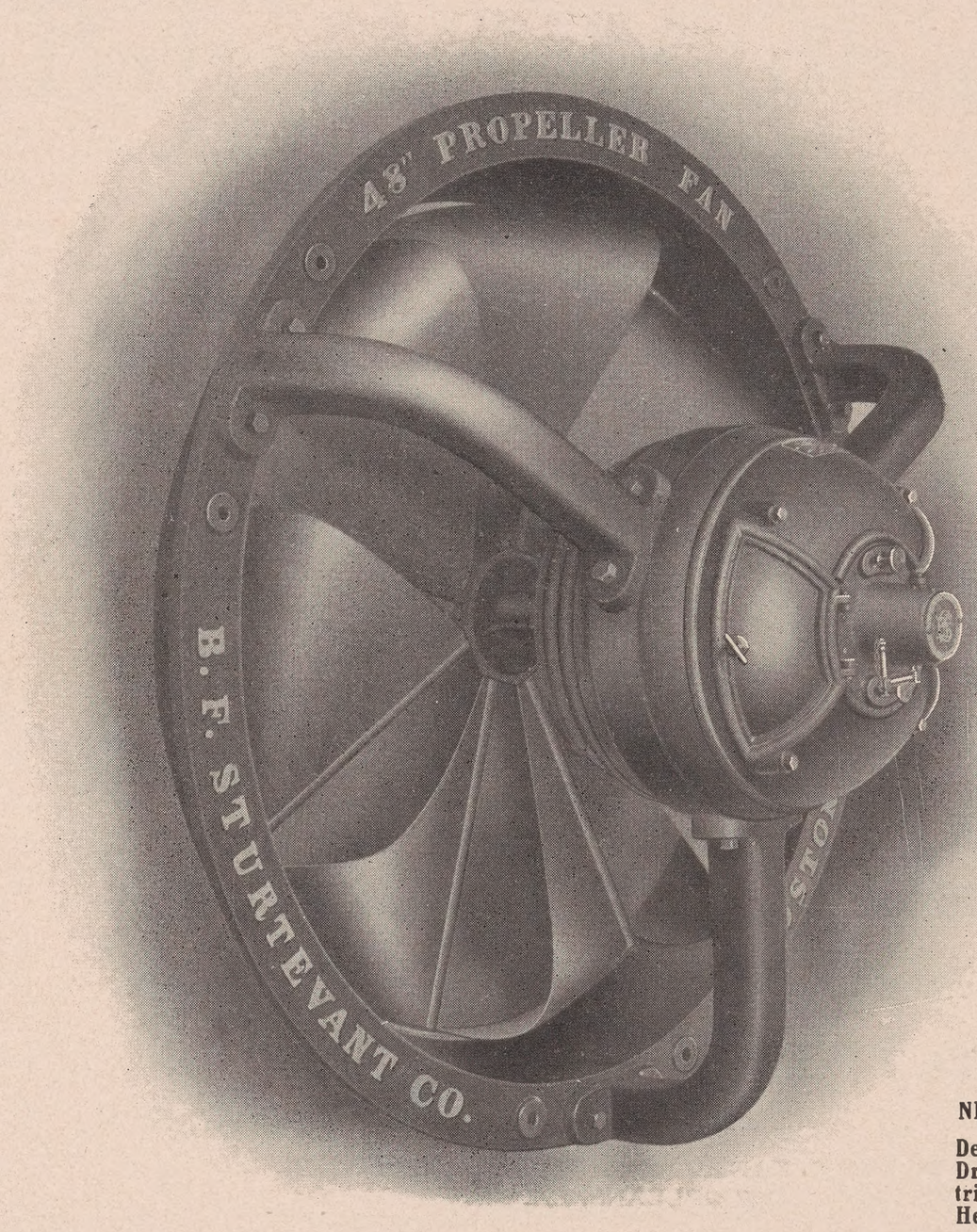

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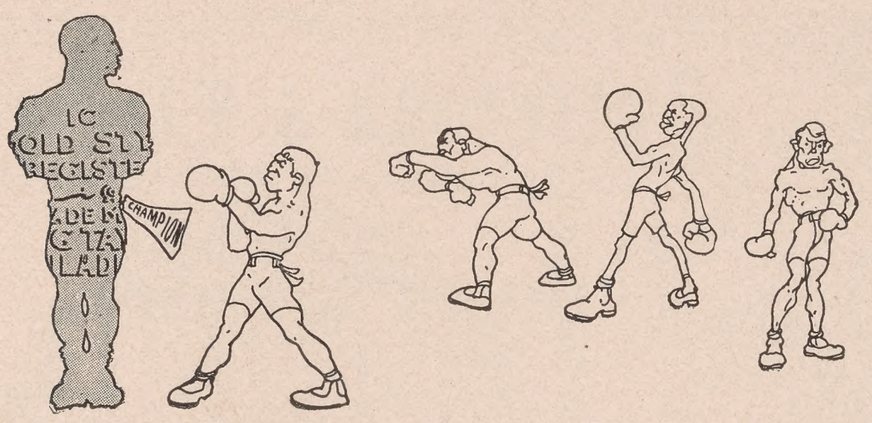

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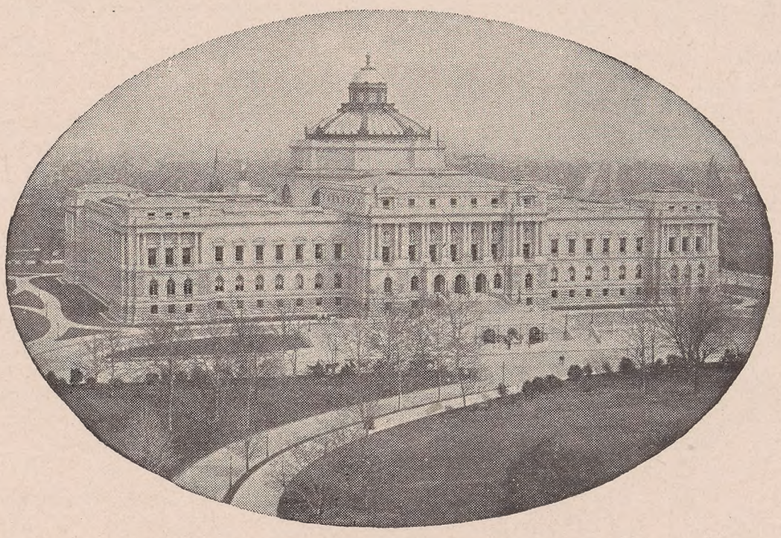

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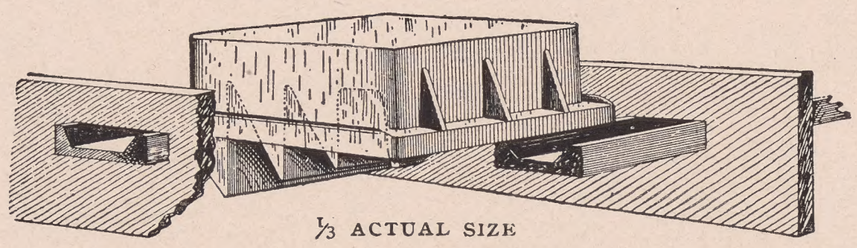

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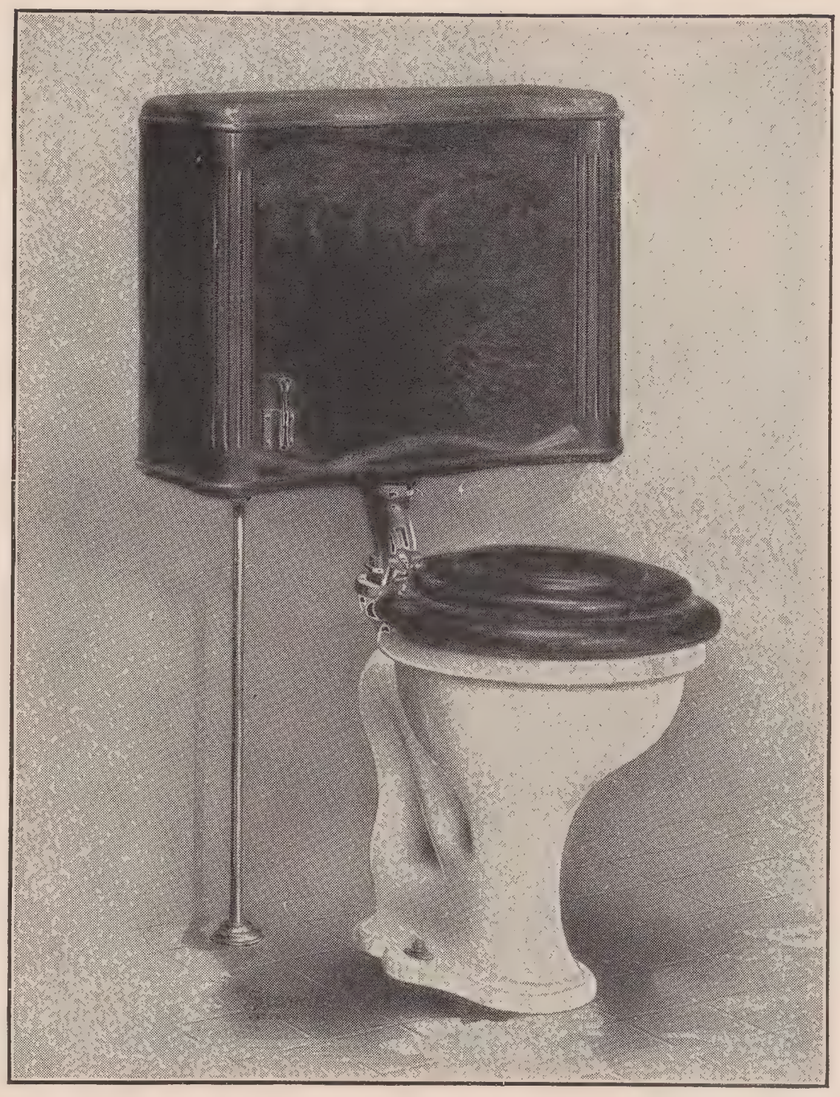

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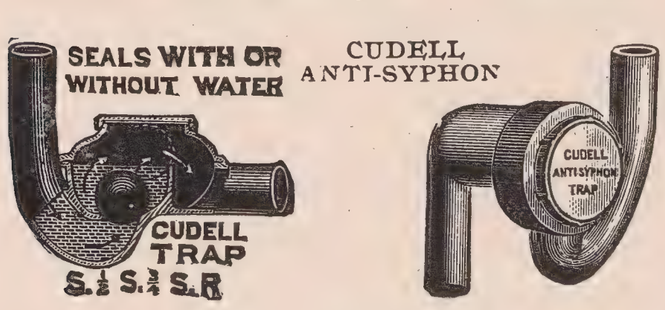

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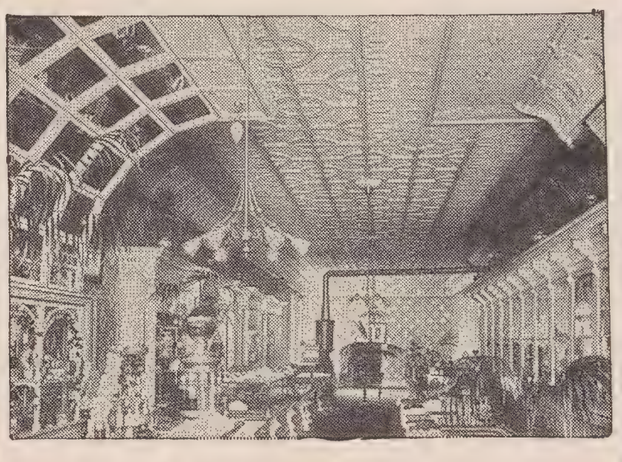

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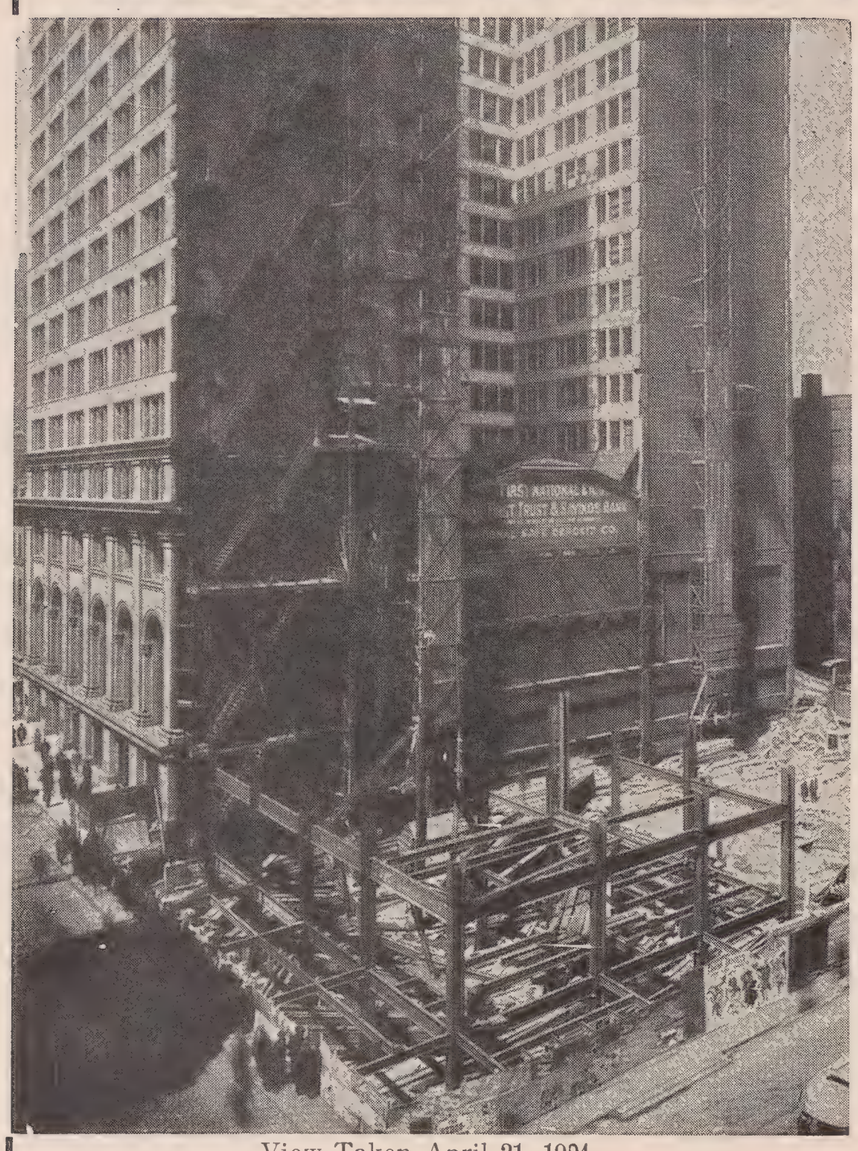

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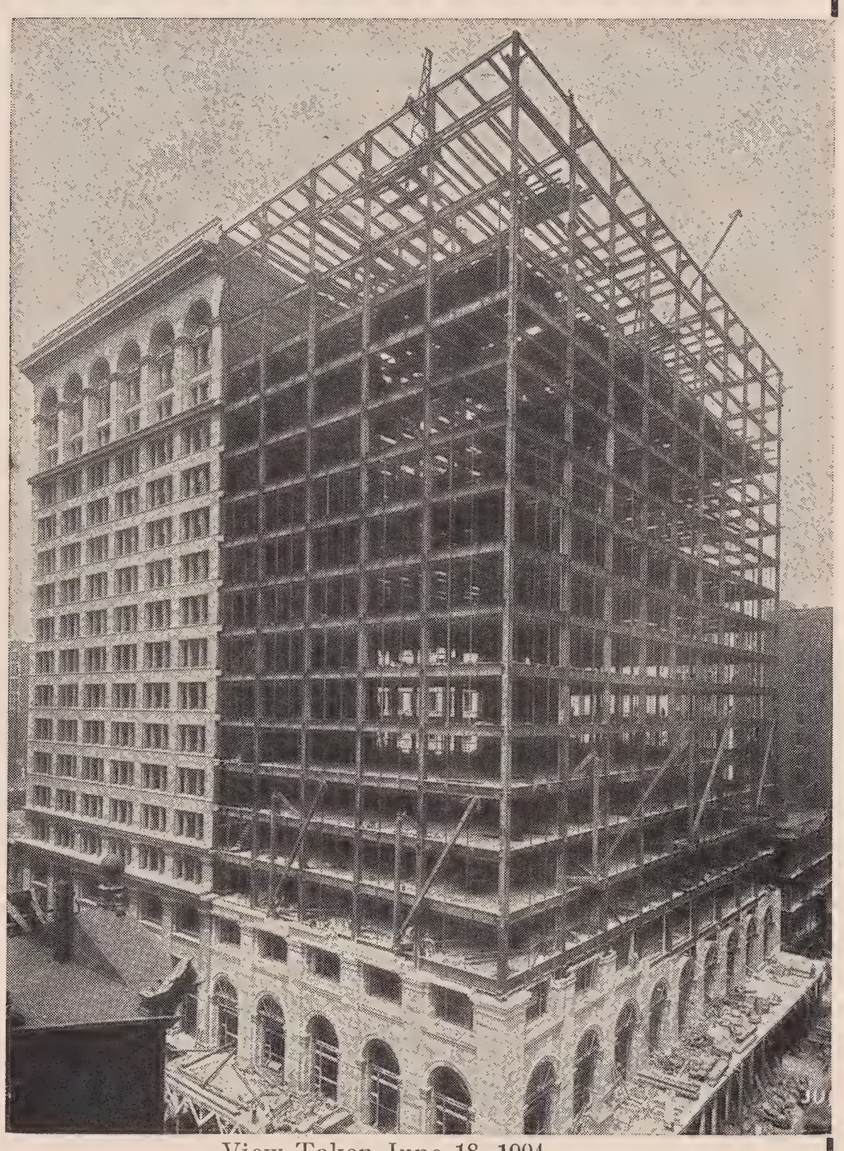

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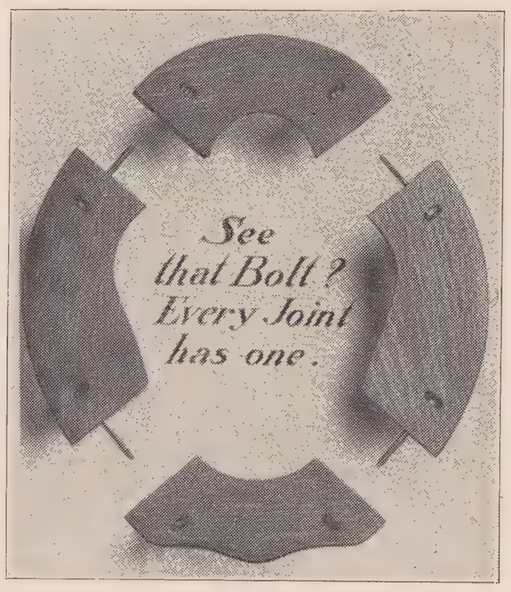

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CONSTRUCTION, DECORATION AND FURNISHING

ISSUED ON THE 15TH OF EACH MONTH

PUBLISHED BY PORTER, TAYLOR & CO.

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Possible Building Improvements.

We hope that our professional friends will read the article in another column on "Recent Improvements in Building." Some portions of the article relate rather to possible than to actual improvements, but they are, perhaps, not less interesting on that account; and the suggestions in regard to extending the use of structural metal in dwelling-houses are of importance, not only to architects and builders, but to the people who are to inhabit the dwellings, and to those who insure them and their contents.

We remember once, in Paris, seeing a workman come out of a new house, pick up an iron beam which was lying on the sidewalk, and carry it into the building under his arm. The beam, as we remember it, was about five inches deep and nine or ten feet long; and it seemed to us then, as it has ever since, that such beams would have a wide field of usefulness in this country. Imagine, for example, that six-inch beams could be rolled to a weight of five pounds to the foot, in place of the present minimum of about twelve pounds. A six-inch beam of this kind would weigh just about as much as a two by ten spruce beam of the same length, and, at present prices of timber and of structural steel, would be approximately the same in cost, while the steel beam would be considerably stronger, and much stiffer. In building an ordinary city dwelling-house, the steel beams would be more readily set in place than wooden beams, being uniform in width they would be much more easily and quickly levelled; and there would be no trimming to do around fireplaces and flues, as the beams could be built directly into the flues, and the hearths for the fireplaces would be built on the beams, with a support of bent bars under them, without requiring the brick trimmer arches which give so much trouble with wooden beams, and are so unsatisfactory when built. With the beams spaced at the distance usual for wooden beams, there would be no need of plates under their ends, as the weight would be better distributed than under wooden beams; nor would there be any need of anchors, as a steel beam, being unshrinkable, holds to a wall of masonry with at least ten times the force that a wooden beam does.

For laying wood flooring on top of the steel beams, a sharp-pointed dog, driven into the edge of the floor board, and hooking under the flange of the beam, so as to draw the board tight down to the metal, would be suitable for matched flooring; and it might have a double point for square-joint flooring. Such dogs, if properly designed, could never move or draw out, and would hold the flooring more securely and permanently than nails in timbers. For carrying the ceiling, metal lath would be necessary. Although this material is being gradually improved, it needs still further improvement, and the price of it is much too high. One of the best varieties weighs only a little over three pounds per square yards, and sells at nineteen cents, or at the rate of nearly one hundred and twenty dollars a ton. This is at least twice as much as it ought to cost, and the design should be modified, so as to give it greater stiffness without materially increasing the weight. Something has already been accomplished in this direction, but what is required is a material which, when applied to beams or studs sixteen inches from centers, will be as rigid

as wooden lathing, so as to do away with furrings, stiffeners, stretchers and all other devices of the sort; and it should be made flat and straight in manufacturing, so that it can be properly covered with two coats of plastering. Such lathing as this, secured to the frame, and the pieces secured to each other, by something better than the wretched wiring now in use, would be of great value to the whole community, not only for buildings with metal framing but for those of the old type, and would do more than anything else, perhaps, to promote the change from combustible to incombustible construction, which is now delayed by obstacles which a little thought could easily overcome.

Requirements of Concrete Building Blocks.

The manufacturers of concrete building blocks must secure improvements in their machines and blocks to reach the best results. By coöperating with architects it may be possible to produce as wide a variation in the construction of private residences, apartment houses and business buildings as it is now with wood, brick or stone. For the facing of buildings blocks must harmonize with the surroundings and architectural treatment. The manufacture of purely ornamental concrete blocks is a feature of the industry that has received comparatively little attention, for the rush has been to produce blocks cheaper and more durable than bricks or stone. Poor cement workmen and unskilled masons have contributed their share toward injuring the standing of the blocks. Indeed, the workmen in many instances show a surprising amount of ignorance in laying the blocks which injures the beauty and value of a wall composed of them. An important need of the industry is a class of efficient workmen who can understand the value of artistically combining the different kinds of blocks in harmonious structures. The artificial coloring of the faces of concrete blocks has been attempted with more or less success, but the most satisfactory way to do this, it has been found, is by using colored sand stones in a mortar for mixing on the surface of each block. By having a solid facing, the stone blocks can better resist the destructive effects of time and weather. There is no material so uncertain in its action as concrete unless made carefully according to well known formulas. The manufacture of cements has reached its present stage of success only through years of experiment and test. The best Portland cement is the most valuable product of the ages for a wide class of work, and its reliability is well established. But when we mix the cement with sand or other foreign substances we introduce an element which may or may not weaken its efficiency. Concrete building blocks have come to stay, and their influence upon our future building will be far reaching, but it is time that a note of warning should be sounded against their careless and inefficient manufacture, and also against the fault of crude designs. The materials must be made popular among architects by virtue of their intrinsic qualities.

The Mission Style of Architecture.

The desire for simple lines and good proportion among those of cultivated taste has within recent years caused a growing demand, especially in the West, for the so-called mission style of design in buildings and furniture, based upon the remains of old Spanish work in Southern California. Where the designer recognizes the limitations of the style and the surroundings are appropriate very charming results are often secured. It best lends itself to low broad masses, simple outlines and roofs of low pitch. With these characteristics, graceful sweep of gables, deep porches and an interior court, picturesque and well nigh ideal suburban and country houses can be designed, especially adapted for warm latitudes, that will have much of the true spirit of the style. In too many instances this style has been used for buildings to which it was not adapted. It is not suited to ordinary commercial buildings, nor to street fronts in city blocks, nor can satisfactory results be obtained in buildings over two stories high. It has been used quite successfully in the design of railroad stations, notably where the roads traverse the country in which the style may be said to be indigenous, and some very good libraries and schoolhouses have been designed in this style. The most successful mission churches have been those which have followed their prototypes with considerable fidelity. While its chief features are derived from the Moors and the Italians, these have been adapted and combined by the Spanish builders to produce a style with a charm all its own. Its Mooresque origin suggests the character of the ornamentation most appropriate, and its most effective application. While such ornament correctly applied adds beauty to the work few styles are less dependent upon ornamental detail. Its true spirit, strong in mass and refinement and simplicity of line, can be obtained with comparatively few elements of design, coarse material and finish, and freedom from ornamentation. To interpret the style with just appreciation one needs to come under the spell of those old missions and their harmonious surroundings.

Progress in Grouping of Buildings.

Considerable distinction awaits the American city that shall first adopt the Paris custom of awarding each year a prize for the best designed building of the year. While America as yet has not advanced to the point of such recognition of good architecture, progress is making in other directions, notably in the grouping of buildings of a public and educational character. Several cities with the assistance of the architectural profession have under consideration, carefully prepared plans for the rearranging and grouping of public buildings, erection of monumental approaches to avenues and parks, the beautifying of water fronts with terraces and ornamental bridges and other civic improvements and embellishments. Most of these plans require in the larger cities great expenditures of money for their fulfillment, but with the rapidly growing sentiment in their favor this obstacle will not be found insurmountable. In this regard, the smaller and less congested cities have considerable advantage, as convenient locations for the grouping of buildings can be obtained at comparatively moderate cost. The list is constantly growing of educational institutions, the old as well as the newer, that are working to a harmonious plan for the arrangement and design of their buildings. It can not be urged too strongly upon those in authority that the first intelligent step is to secure under competent advice, a general plan. A comprehensive plan can not be decided upon too soon, and should wisely provide not only for present requirements but for growth far in the future. It would thus form a foundation upon which each stone in the future superstructure would fit into its proper place to form a consistent, harmonious, beautiful whole.

RECENT IMPROVEMENTS IN BUILDING.

II.

BY T. M. CLARK, ARCHITECT.

There are many indications that this country is preparing for a great change in its habits of construction, and that the characteristic American building of the future is to be a very different thing from the flimsy construction of boards and laths to which we have been so long accustomed. It is not impossible that sentiment may have had something to do with the change; and that the feeling which has grown so rapidly among us within the past five or six years, that this country is a great force among the nations of the earth, and that its duties and responsibilities have become proportionate to its power, may have its influence in leading people who can afford to pay for what they like, to demand in their buildings, as many do at present, a seriousness of design, and a massiveness of material and construction, utterly opposed to the pettiness and sham once believed, with too much reason, to be inseparable from American architecture. Undoubtedly, a part of the credit for this improvement is due to the high artistic feeling of American architects; but the best architect must shape his designs to suit his clients; and the impression of power, as distinguished from richness or show, in which our great cities already surpass any others in the world, is due quite as much to the taste of the owners of new buildings as to that of the architects whom they employ.

In the design of country dwelling-houses the movement, although more recent, and, as yet of limited extent, is still more conspicuous than in city buildings, for the reason that the change is greater; and, even now, it is difficult for any one but an architect to realize that the structure of studding and clapboards, which has been in universal use here for such purposes for nearly three hundred years is destined to give place, within a comparatively short period, to a far nobler and more enduring fabric of masonry and steel. Aesthetically, the world will be the gainer by the exchange of a mode of building so limited in architectural expression, and so mean and shabby in its rapid decay, for a more solid system of construction; but artistic considerations, although they will be influential in introducing and defining the new fashion, will count for less than economical ones in securing its general adoption.

Among the economical arguments which will lead, before many years, to the substitution of metal and masonry for wood in country, as well as city buildings, is likely to be the unanswerable one of the smaller cost, all things considered, of the more substantial construction. Already, strength for strength, a steel frame is cheaper, at normal prices, even in this country, than one of wood; and it is only in details that the more enduring and incombustible structure exceeds in cost the familiar type. These details can be, and undoubtedly will be, very much simplified and cheapened as soon as the demand warrants the working out of a new system, while the cost of framing timber must, apparently, steadily advance. Few people realize that, while structural steel can be produced more cheaply in the United States than anywhere else in the world, our timber resources are already smaller proportionately, than those of any other civilized country, except, perhaps, Spain, while the enormous consumption of lumber is rapidly reducing them still further. Architects, who now constantly see doors and other finished woodwork of Oregon cedar and Swedish fir, brought four thousand miles to be used on the site of what were supposed, not so very many years ago, to be the inexhaustible pine forests of Massachusetts, New York and Pennsylvania, have no difficulty in foreseeing the abandonment of timber framing in all but the remoter regions of the country as soon as a cheap and satisfactory substitute can be found for it; and, judging from what they have already accomplished in this direction, it is the architects who will lead in adapting metal construction to new and greatly extended uses. The first need is, probably, lighter shapes for beams. Very light steel beams are rolled in France and Belgium, to be used as a substitute for wooden beams, and shapes of the same kind, which could be handled and cut readily by builders, would be very useful in this country.

Another requisite for dwelling-house construction in metal is a light and efficient connection, perhaps in the nature of a stirrup, which will not require bolting or riveting. For ordinary dwelling-house work the methods used in designing the metal frame of an office-building are totally inapplicable. The country builder can not lay out his steel work beforehand with any precision; he can not handle heavy beams, and can not, with the materials within his reach, fill in wide spaces between the beams. What he needs is framing stock, any piece of which can be handled by one or two men. In order that supplies of material suitable for his use may be carried by dealers, as timber is in the lumber yards, he must be able to cut his floor-beams and uprights, either with a machine or a hack-saw, as easily as those of wood; to secure them together by adjustable brackets, something like those used in library work, which will not involve drilling or punching; and to frame his headers and tail-beams by means of adjustable hangers. With light beams, at such a moderate distance apart that floor-boards could be laid directly upon them, secured by clips in the joints, and metal lath fastened underneath, a structure would be formed which would be practically, if not theoretically, economical, and, enclosed by walls of brick, stone or concrete, or, possibly, by steel studding, covered on both sides with metal lath, and finished outside and inside with cement, would be cheap, strong and undecaying. It would not be fireproof in the way in which the beautiful system worked out for office-buildings is fireproof; but that is not necessary for dwelling-houses; and, with ceilings, walls and partitions plastered on metal lath, or on terra-cotta or concrete, it would be practically incombustible. Even stairs might, probably, be worked out with adjustable brackets, so as to suit any conditions, at a cost no greater than that of wood-framed stairs; and to the roof-purlins, attached with adjustable clips, would be hung tiles, such as are made in France and Germany, and should be made here, at a cost no greater than that of good shingles, while they are put on more easily than shingles, need no nails, and are everlasting. For gutters, skylights and many other accessories, where the indestructible copper can not be afforded, galvanized iron, which is much better made now than it was a few years ago, would be at least equal in durability to wood.

It is true that some time is likely to be required for the development and introduction into current use of a structural system of this kind, but circumstances seem to be leading unmistakably to such development, and, meanwhile, many details of the more costly fireproof work, which would be applicable also, in part, to dwelling-houses,

have been greatly improved, as well as reduced in price, within the last few years. Marble tiling for floors, for example, costs now little more than one-third the price demanded for it ten years ago, and is much better done; and the cost of the "terrazzo" flooring, of bits of marble imbedded in cement, has been reduced in even greater proportion. The floorings of earthenware or cement tiles, once so popular, have been for some years rather out of fashion, although the cost of them has been reduced in about the same ratio as that of marble tiling, and it is not until very recently that new and charming varieties of floor tile have been introduced, which seem likely to revive the use of a material excellent in itself and capable of lovely architectural effects. It is a satisfaction to know that the best of the new tilings are of American design and manufacture, and it is hardly less satisfactory to find that they have met with immediate appreciation from the American public, which has welcomed their picturesque irregularity and dull but beautiful coloring with a readiness which gives a high idea of the native artistic instinct of our people.

In connection with the masonry filling between metal floor beams, much has been accomplished in the way of improvement within the past few years, but much still remains to be done. It ought to be observed that such filling, while necessary in warehouses, and perhaps in lofty office-buildings, hotels and apartment-houses, where a conflagration may accumulate heat enough to cripple or destroy metal floor beams not protected in this manner, is worse than useless in dwelling-houses, where, unless a marble or tile floor is to be laid, it simply burdens the floor and adds greatly to the cost of the building without any necessity, as no dwelling-house fire could spread through a floor of steel beams, with a wooden floor laid directly on top of them, and a plaster ceiling, on metal lath, applied to their underside.

Where, however, such filling is necessary, it can be had now in a great variety of forms. Without entering into the controversy between the so-called "standard" floor filling, made with flat arches of cellular terra-cotta blocks, and the different concrete fillings, reinforced with metal in various forms, it may, perhaps, be suggested that patentees and manufacturers, particularly of systems of concrete filling, have made a mistake in endeavoring to surpass each other in the width of the spans which they would undertake to cover. If concrete were a perfectly invariable material the maximum spans might be used with confidence, but it is very far from being so, and scores of accidents, which have done much to discredit all systems of reinforced concrete construction, have occurred, in consequence of attempts to cover spans of unnecessary width. It is true that, in theory, the cheapest steel-framed structure is that in which the floor-beams are spaced most widely apart; but, with concrete, the weight and cost of the filling between the beams increase, roughly, in proportion to the square of the span, so that the limit of spacing for the greatest economy in the combined construction is soon reached, and, in practice, it is desirable to reduce the span of the filling still more, the cost of the additional steel required, at normal prices, being fully offset by the saving in the thickness of the floors, the reduction in weight on the uprights and the foundations, the lessening of the volume of wet concrete which must be dried out before the finishing of the building can proceed, and the simplification of the problem of laying wood floors over the concrete construction, a problem which has not yet been satisfactorily solved.

HOW TO BECOME AN ARCHITECT.

BY W. L. B. JENNEY, ARCHITECT.

OF course, most every one knows that when such a course is practicable, the easiest, best and surest road for a student is to obtain the most complete liberal and professional training—a college course, then a course in the Institute of Technology or the Architectural course in such institutions as Columbia, Cornell, Champaign, etc., and then the course of the Ecole des Beaux Arts at Paris, after which journey to see the most noted buildings. If he can obtain admission go to the School of Athens.

It is assumed that our student has kept up a constant judicious course of architectural reading during his entire course of study, so that he is prepared to derive the greatest benefit from his travels. What I have outlined is no exaggeration. Read Vitruvius, who wrote about the beginning of the Christian era, and see what he thought, at that time, an architect should know. Of course, he should be able to speak French, some German, and Italian, especially Italian enough to understand and make himself understood. His course at the Ecole will have made him familiar with French, but he will find some Italian of decided benefit. The writer well remembers how annoying he found his far too limited knowledge of Italian was to him, when he was traveling in Italy, and his determination to speak it much better on his next visit. It is true the educated persons he met spoke French or English, but it is often to the peasant or to the workman that he is forced to apply for information, who knows no language but Italian, and he must do the best he can, and is often much vexed that he can not obtain the little he wants to know. His pocket dictionary may have helped him to ask his question, but not to understand the answer.

We must admit that it is only the very exceptional student that can obtain the means to follow the foregoing course, and the average student must get on with far less help from others. One calls to mind successful practitioners who were what is called self-educated. Our student is determined to do as well as they have done, and commences to study how he can best do it. He seeks a place in some architect's office, even without pay, and commences to draw. He attends an evening school of which there are usually several in our larger cities. He soon becomes so useful that the employer commences to pay him a salary, little enough perhaps at first, but it is at least an encouragement. Only a short time since a well known architect told the writer that he felt almost ashamed when at first he received his pay each Saturday night, feeling conscious that he did not earn it, but it made him determined that he would and that right soon, and soon his employer promoted him, and he was able to lay by a little each week, which enabled him to take a two years' course at Columbia College, under that dear old man Professor Ware, until today his practice and reputation are equal to that of some of his competitors who were able to follow the schools from the outset with all the advantages that a wealthy parent could give them. Self education in every branch is hard work and requires much determination and self sacrifice, and it is only those who possess these qualifications that succeed.

Graham Photo Co., Photo.

INTERIOR VIEW

RESIDENCE, C. H. SHAFER, LOS ANGELES, CAL.

C. H. Brown Architect

RESIDENCE OF MR. CAMPBELL, SPOKANE. WASH.

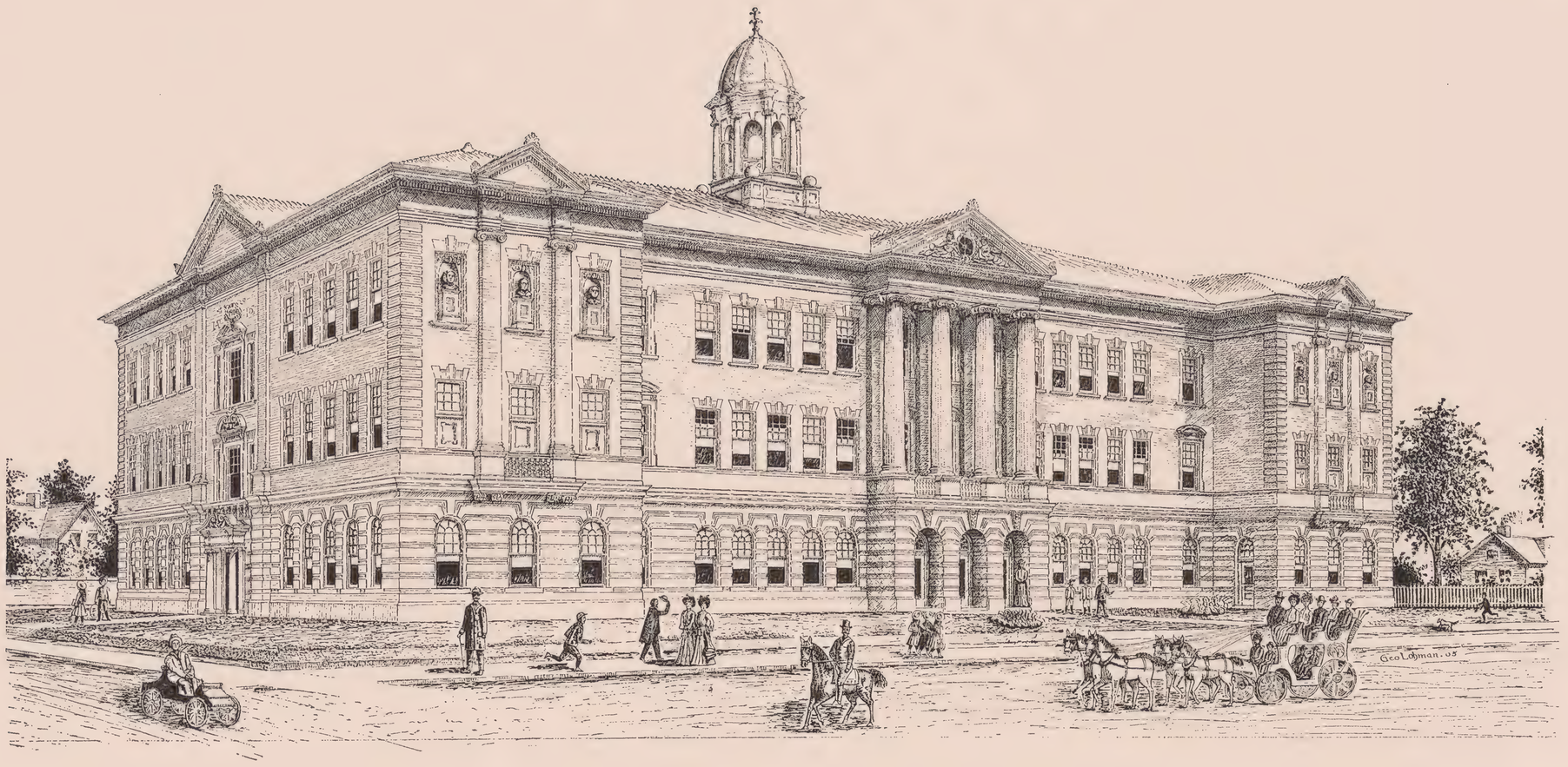
Cutter & Malmgren, Architects

RESIDENCE, ERASMUS WILSON, LOS ANGELES, CAL.

DENNIS & FARWELL, ARCHITECTS

FLEUR DE LIS APARTMENTS, SHERIDAN PARK, CHICAGO

FRANK V. NEWELL, ARCHITECT



NEW HIGH SCHOOL, DENVER, COLO.

D. W. Dryden, Architect

ROGERS PARK CONGREGATIONAL CHURCH, CHICAGO

J. E. O. Pridmore, Architect

VIEW IN DINING ROOM

Graham Photo Co., Los Angeles

VIEW IN RECEPTION HALL

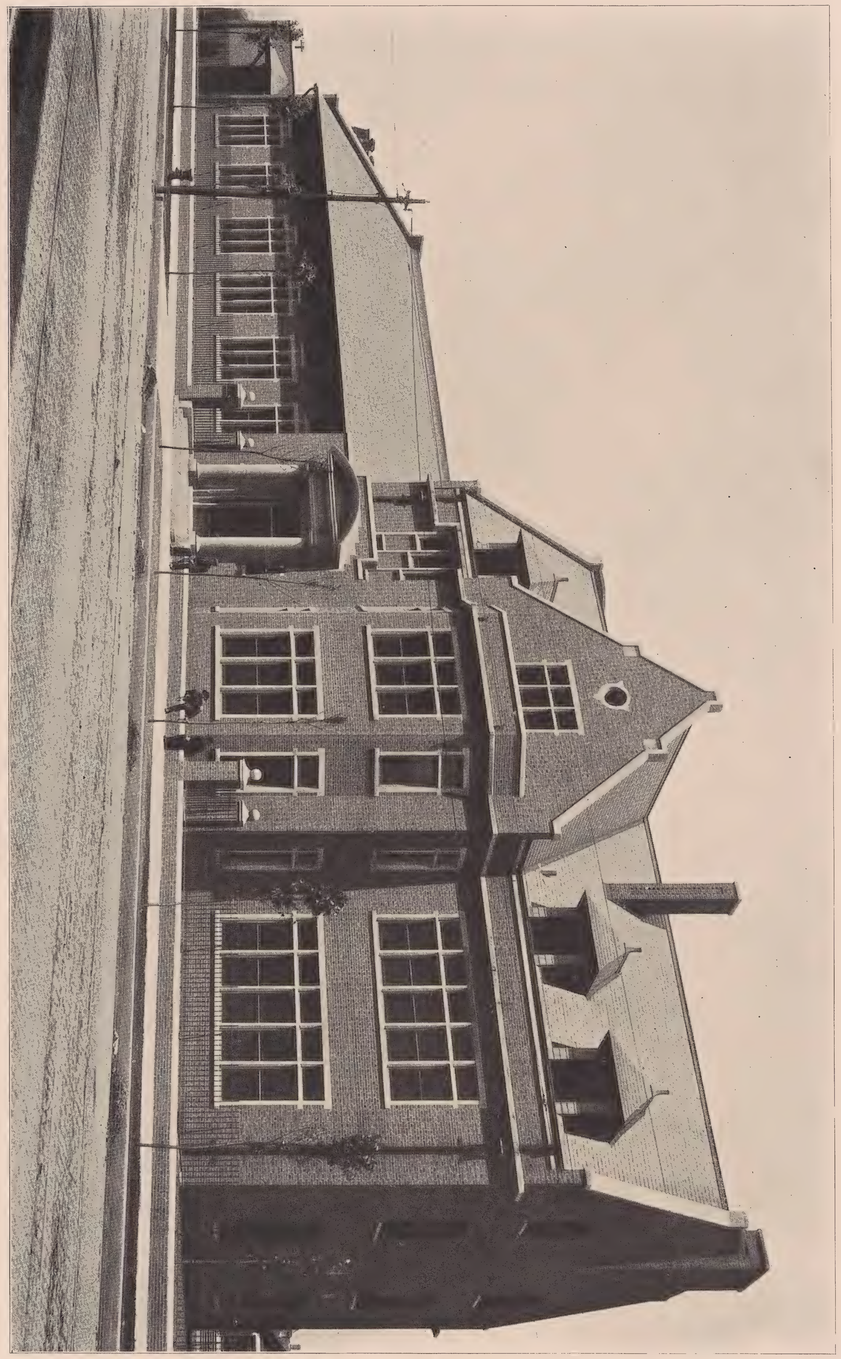
RESIDENCE, ERASMUS WILSON, LOS ANGELES, CAL.

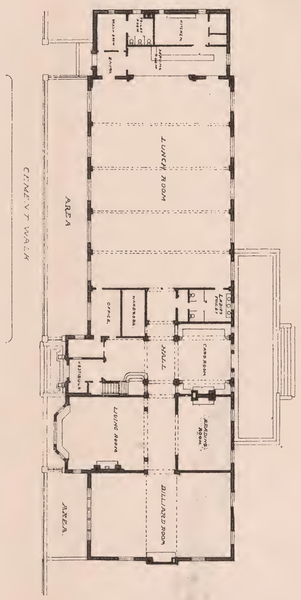
DENNIS & FARWELL, ARCHITECTS

INTERIOR VIEWS, MEN'S CLUB HOUSE, McCORMICK REAPER WORKS, CHICAGO.
Jas Gamble Rogers, Architect.

Vol. XLVI. THE INLAND ARCHITECT AND NEWS RECORD No. 1.

MEN'S CLUB HOUSE, McCORMICK REAPER WORKS, CHICAGO.
Jas. Gamble Rogers, Architect.





DETAIL UPPER STORIES.

DETAIL, LOWER STORIES

Vol. XLVI. THE INLAND ARCHITECT AND NEWS RECORD No. 1.

FACADE

THE CHAPIN & GORE OFFICE BUILDING, CHICAGO

RICHARD ERNEST SCHMIDT, ARCHITECT

Walls of Blue Bedford Stone from the Hoosier Quarries of the Bedford Quaries Co., Chicago.

DETAIL OF ENTRANCE AND LOWER STORIES.

TRINITY BUILDING, NEW YORK.

FRANCIS H. KIMBALL, ARCHITECT

GENERAL VIEW, MAIN FACADE.

TRINITY BUILDING, NEW YORK.

FRANCIS H KIMBALL, ARCHITECT.

The Foundation Company,
Caisson Foundations.
Wm. Bradley & Son,
Cut Stone Contractors.

Walls of Blue Bedford Stone from the Hoosier Quarries of the Bedford Quarries Co., Chicago.

Atlas Portland Cement Co., Cement.
Perfect Safety Window Guard Co.
Geo. P. Hall & Son, Photographers.
Mississippi Wire Glass Co., Wire Glass.

Walls of Blue Bedford Stone from the Hoosier Quarries of the Bedford Quarries Co., Chicago.

DETAIL, UPPER STORIES.

TRINITY BUILDING, NEW YORK.

FRANCIS H. KIMBALL, ARCHITECT

Batterson & Eisele,
Marble Work,
Three Lower Floors.

VISTA IN MAIN CORRIDOR.
TRINITY BUILDING, NEW YORK.
FRANCIS H. KIMBALL, ARCHITECT

Winslow Bros. Co., Bronze.
John H. Shipway & Bro.
All marble work above third floor.

Winslow Bros. Co., Bronze.

TREATMENT OF STAIRWAY.

TRINITY BUILDING, NEW YORK.

FRANCIS H. KIMBALL, ARCHITECT.

Winslow Bros. Co., Bronze.

ELEVATOR ENTRANCES.

TRINITY BUILDING, NEW YORK.

FRANCIS H. KIMBALL, ARCHITECT

Standard Plunger Elevator Co.,
Elevators.

RESIDENCE, W. G. FRICKE, OAK PARK, ILL.

FRANK LLOYD WRIGHT, ARCHITECT

Graham Photo Co., Los Angeles.

RESIDENCE, A. C. ALLERTON, PASADENA, CAL.
JOHN PARKINSON, ARCHITECT, LOS ANGELES, CAL.

An earnest student usually draws well before he knows what to draw—before he has sufficient knowledge of the styles and of proportion to keep his drawings pure and simple—dignified and pleasing. Never rely upon ornament—a good drawing is pleasing from its general forms and proportions alone without detailed ornament and without a molding, and this is the way drawings should be made and studied in outline alone, and when this is quite satisfactory, then if you desire, ornament or accent the construction, but never construct the ornament.

In the office of most architects there is a considerable library, and our student should avail himself of every opportunity to study these books, look over carefully the plates, and take notes.

If he has not begun already, he should now commence his scrap books. Select a well bound scrap book of good size, not too small, number the pages, and make a classified index. This should be a separate volume, for later in life the scrap books will become very numerous. Go at this only after a careful study. Make your first volumes, exteriors, general facades, one volume, masonry, brick, steel skeleton, terra cotta, frame, one volume, office buildings, one, banks, one, court houses, libraries, hotels, etc., and these subdivided, leaving numerous pages under each class for future additions. Let the student always carry in his pocket a pad of good sketching paper, pencils and a fountain pen. After a little practice he will prefer to sketch with the pen; when he gets to his office let him complete his sketch, put on the date, locality, and anything of interest. Never miss an opportunity to sketch everything he sees that he thinks may be of interest or use to him hereafter. Let him cut from the magazines, papers, etc., all prints he considers of value, and collect photographs wherever he has an opportunity, having his own camera. Put all these collections in the classified scrap books that must be carefully indexed, as Poole indexed the magazines. It is easy to see that in a few years our student will possess a valuable working library that really has cost him very little more than the valuable study.

It can be readily seen how important is the classification and indexing, and that the scrap books should be of the most substantial character. Some of my old scrap books needed rebinding years ago.

Whenever the student is studying books of architectural plates he should make small tracings of bits that he will like to refer to hereafter, and note the work wherein he found them. These tracings should be pasted in their proper places in the scrap books. Although the writer has detached scrap books designated by the year 1872-6, 1877-9, etc., still he has always regretted that he did not start a regular classified collection properly indexed long ago. He remembers hundreds of things that he now wishes were in his scrap books, so arranged and indexed that they could be readily found.

There will be much in these scrap books that he will use in his daily work, and the spirit that they will give to his work in designing will make him what is known as a rapid workman, of great value if he is practicing for himself, and highly appreciated and well paid if he is at work for others.

Our student has now become so conversant with the different styles of architecture that his designs will be pure, quiet, dignified and always pleasing.

About 1886 the writer was in his office in Chicago when Mr. Fred Law Olmsted called. They had known each other long ago, during the campaign of Vicksburg, when Mr. Olmsted, who was vice-president of the Sanitary Commission, visited the army to see what the commission could do to benefit the soldiers. We were with Sherman's command at Young's Point opposite Vicksburg, and were riding along the levee which was lined with steamboats that had brought supplies and men to Grant's army. They were all of that stereotyped pattern known as river boats, all with a light gallery around the saloon deck profusely ornamented with three boards cut into poor flimsy patterns by the jig saw and all painted white.

Mr. Olmsted stopped his horse, saying, "Let us stop a moment and look at those boats. How easy it would be to improve their 'architecture.'" I saw at once that I must lead on Mr. Olmsted and I would get some valuable information.

At that moment I caught sight of the gun boat "Tyler" coming down the river, to which I called Mr. Olmsted's attention. I remarked, "for example that gunboat was once a river boat exactly the counterpart of these." "That is an example," says Mr. Olmsted, "see what was done—simply took out the useless gallery and ornamentation simplified and made practical—see how much the architecture is improved; just what should be done to all these boats." I have always called this my first lesson in architecture. Learn to improve what you see about you.

In 1900 the writer attended the International Congress of Architects at the World's Fair Grounds in Paris, where we met Mr. Dumontier, the architect-in-chief of the Duchy of Brabant, who invited him to be sure and call upon him when he came to Brussels, which he did about a month later. We were riding together when in Brussels, in the celebrated woods in which Wellington marched, on leaving the ball of the Duchess of Richmond, on his way to Waterloo. He gave directions to the driver and we soon entered the new suburb. There were new houses, many completed on either side of the boulevard, through the wood. Dumontier said, "Look at these new houses, they are what we call the style de la Jeunesse (youth). See that front door? The top twists off at the summit in the most extravagant rococo style like the corner of a gilt picture frame. You might ask does he intend to gild it?"

All the details of the houses were in a similar, absurd, extravagant style, certainly original, for I had never seen anything like it. Dumontier added, "These houses are all by young architects; it is not that they lack talent, for you can see that they have plenty. They are all striving after originality, and hope to make a reputation in that direction. They will quiet down as they get older and will design in a simple and dignified manner, and will be the first to laugh at what they will style the follies of youth."

Our student is now well informed on all matters pertaining to architecture as a fine art; he must now study the engineering of architecture.

First, I would recommend that he should carefully read Kidder's Architects' and Builders' Pocket Book; a misnomer, by the way, for its dimensions have far outgrown the pocket. It should be kept ready at hand and be studied until the student can refer to every subject and quickly solve his problem and be sure that he has understood the book correctly. He should then study elementary and prac-

tical electricity, understand what is best for an electric plant in the buildings he is likely to have in charge, the wiring for lighting, etc.

He should then take the different apparatus and appliances, such as heating, plumbing, sewerage, elevators, etc., it is not necessary that I should enumerate them, but it is necessary that the architect shall be able to write a clear and proper specification therefor, with a diagram of the necessary layouts, etc.

Of course, you will say that the writer has outlined the work of a lifetime, and certainly he has, and very properly, for a professional man should keep up his studies as long as he is in professional practice, or he will find himself dropping behind and younger men taking his place.

MUNICIPAL IMPROVEMENTS.*

II. Modern City-Making.

BY ALBERT KELSEY, ARCHITECT.
Chairman Committee of Experts. Art Federation of Philadelphia.

REDUCED to a formula, the elements of modern city-making are circulation, hygiene and beauty. Circulation may be termed the anatomy of a city; the transit facilities above, below and on the surface of the ground, the life arteries or pipe galleries for the distribution of public utilities, including a sewerage system.

The interdependence of circulation and hygiene is evident.

Hygiene represents the aspect and prospect of the city, its general salubrity, the density of population, the lighting by night and day, a free sweep of air, and lastly, a proper density of construction.

A fixed ratio should exist between the voids and solids of all quarters of the city, whether such quarter be one of lofty buildings or of modest two or three story residences. By this is meant a proper ratio between blocks of buildings on the one hand and the streets, courts, and open spaces surrounding them on the other. If a sufficiency of open space is provided, beauty is possible. The interdependence between all three—hygiene, circulation and beauty—is now evident.

Beauty represents the expression of a city. Cities, like individuals, have natural and artificial expressions. The dominating chimneys of the manufacturing town, and the surmounting domes and minarets of the oriental city, are each natural expressions.

The savage man has much the same faculties as his civilized brother, but these faculties are less developed. The savage man is unkempt, shaggy and dirty.

The ordinary city is unkempt, i. e., it is a haphazard agglomeration and is usually dirty. But as cities develop—whether it be the crude and purely utilitarian manufacturing town or the mysteriously beautiful city of the Orient—in this age of tolerance and universal knowledge they soon produce one or more cosmopolitan thoroughfares, providing easy circulation, good hygienic properties and some degree of beauty.

The city begins to wash itself. It may be but Pera Street of Stamboul, merely "a lick and a promise," yet it illustrates the fact that all cities have certain requirements in common when they begin to groom themselves and enter into competition with one another.

This social adjustment may take away much from their picturesque charm, and some of their individuality, but in return it brings compensating conveniences and well being.

Consider the manner in which the Germans methodically approach any problem and you will see positive results of their intelligence in the physical development of their well disciplined cities. Consider Paris, with its nearly perfect civil service; its departments of public works and design; its special representative from one board serving on many other boards; with architects, sculptors, painters, horticulturalists and medical men in consultation on problems that are purely engineering problems with us, and the reader gets some idea of the proper way to evolve plans for the carrying out of public improvements.

With Glasgow's public utilities entirely removed from politics, and the municipality successfully conducting its gas and electric lighting, its telephones, water works, markets, parks, baths and lodging houses, and you obtain an idea of what the downtrodden Scot gets for his taxes. Or, again, consider St. Gall, in Switzerland, and one or two other happy communes in the same country, where all public property is administered without taxation and returns a profit annually, and you get another of many object lessons from backward Europe which should encourage you, should you be a social idealist, to hope for much here that is yet beyond the horizon.

Here in "the land of the free and the home of the brave," in all our cities many foul growths must be torn up root and branch before a fair start can be made. But let us not be downcast on that account, for in many European cities conditions were much worse where now prevail high standards of hygiene, circulation and beauty.

Is it to be wondered at that our short term officials often hesitate to inaugurate physical improvements upon really broad and enlightened lines? Not at all. The responsibility is too great. And then the next election must be considered. The contractors who put them in office must be considered. And sometimes better get-rich-quick schemes, such as the reckless granting of franchises must be considered of paramount importance. Yet there is progress. To the remarkable private initiative of our people we owe nearly everything that is public spirited, and in spite of an unfortunate state of affairs which levels down to politics and corporate greed rather than up to the standards of the best trained minds, yet notwithstanding all this several civic patriots have already accomplished wonders, and it is to them we must look for that evolution which will enable our cities to gradually metamorphose themselves upon 20th century lines. Were Haussman alive today he would not apply his rules of thirty and forty years ago to American city-making, but from conditions peculiar to our life and time he would evolve new ones which, if followed, would produce magical results. In reconstructing Paris this is what he accomplished: He transformed a dark, dirty, tortuous and malodorous mediæval city into the brightest, the cleanest, the most open and the most countrified community of any size in the whole world. Briefly, he increased the density of population in proportion to a great decrease in the density of construction.

A uniform six story alignment did the trick.

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*The opening paragraphs are from an address delivered by the Author before Municipal Art Society of Baltimore at Johns Hopkins University, Jan. 8th, 1902.

What possibilties might he not see in our lofty structures; in our rapid transit facilties, and in our adaptability as a people!

Here the principles and rules to govern in working out the immense and delicate problems before us are yet to be formulated, while since Haussman's time they have been drawn up, tabulated and arranged for the most effective guidance in many different fields abroad. We look for private initiative and then to the officials. Among us the rule is that some private citizen or society must initiate the idea, then it must be followed by newspaper publicity, public meetings, etc., before it is worthy of official consideration, while abroad it is planned years in advance of execution by well trained officials. Not only are public improvements schemed out in advance in this manner, but all private enterprises using in any way the public domain have their plans developed, altered, perfected and extended by the city officials, without consulting the public; and with but scant consideration of the wishes of the promoters who supply the funds. Thus railways and trolley lines are not paralleled, real estate operators are not permitted to stampede property values, overhead electrical construction is restricted and carried out only under the most rigid regulations, and the strangling of thoroughfares by all sorts of encroachments, so frequent in this country, is unknown.

A hopeful sign comes from Boston. An agitation started by the Society of Architects is now on foot to secure legislation which will insure a wider use of the laws of eminent domain. The law is to enable the city to go into the real estate business, as it were.

Such laws exist abroad. In the case of the construction of Northumberland avenue in London, and the Avenue de l' Opera in Paris, they enabled the authorities to create two magnificent new thoroughfares at a profit! Not only did these improvements not cost the taxpayers anything, but all abutting properties were subjected to wise and just restrictions which provided and still provides for a uniform treatment of all buildings facing upon them.

The scheme is identical with what our suburban development companies are doing. They buy a tract of land, lay out better and broader streets than the city would build and derive a profit from the sale of the adjoining property thus improved.

Notable illustrations are to be seen at Overbrook, Pelham and St. David's, in and about Philadelphia, where the monotony of a stupid city plan has been broken and beautiful, well wooded, winding avenues have in many cases been given their direction in order to save noble trees.

Such revenue yielding improvements are common to other cities. A less rural but equally profitable example (both financially and from a civic standpoint) is illustrated by Vanderventer and Portland places in St. Louis.

They are all in striking contrast to the methods persued in the construction of the two new boulevards now building in Philadelphia, where the city paid extravagantly for the right of way to enormously enhance the value of adjoining property owned or controlled by councilmen and their friends. These broad parkways, laid out and constructed along foolish and ineffective lines, were routed not to embellish the portions of the city they traverse, not to relieve congestion and ease circulation, and lastly not with any idea of preserving natural beauties. They were graft-laden schemes projected in defiance of the real needs of the people, and are as unprincipled in design as in execution. In fact, in the construction of the finished part of one it is alleged that the only portion of the specifications that has been lived up to is the item describing the bricks to be used for paving gutters, which were manufactured by one of "the gang."

It is in our suburbs, in new communities and in sparsely settled old ones that there is the least excuse for unenlightened development. These areas are usually unencumbered by buildings, and are sometimes free from the rapacity of politicians, and yet it is in just such cases where the opportunities are the greatest that crass ignorance manifests itself most frequently. Many excuses, more or less reasonable, may be advanced for the go-as-you-please, the-public-be-damned methods, followed in congested quarters, but none can be advanced in support of the wanton desecration of our frequently beautiful suburbs. Yet from the Atlantic to the Pacific monotonous rectangular block, are laid out, and are still being laid out regardless of every topographical and scenic consideration and the indefinite extension of uninviting narrow streets goes on unchecked far out into the pure and promising country.

TRINITY BUILDING, NEW YORK.

BY BARR FERREE.

IT is a good thing to have built a good building; it is a better thing to have built another good building. It is a wonderful opportunity to have the finest site in New York on which to build a structure of great size and cost; it is even more wonderful to have had another opportunity of the same kind; and it is most wonderful of all to have eclipsed in the second the success obtained in the first structure. These are the thoughts which naturally occur to one when observing the very remarkable buildings which Mr. Francis H. Kimball has erected on two sides of Trinity churchyard, the Empire building and the Trinity building. No other architect in New York, no other architect who ever lived had such splendid opportunities in the designing of commercial buildings, and it is to Mr. Kimball's lasting credit and enduring fame that he rose to the full height of the opportunities given him and created two of the most successful and most impressive office buildings in New York.

The Empire building is quite an old story; the Trinity building is very new, having been opened for occupancy this spring. But it is impossible not to compare the two, since their long fronts overlooking Trinity churchyard are almost indentical in dimensions, and the fact that two such unusual sites should have been built upon by the same architect is so remarkable as to call for more than passing mention.

Trinity churchyard, as all the world knows, is the most considerable open space in lower New York. Roughly speaking it is about 430 feet long and 250 feet deep. The buildings that overlook it on either side have an immense renting value owing to the ample light and air their offives are permanently assured of, and to the architect they have the additional advantage of being structures that can be seen, seen at all times and in every part. It is hardly necessary to point out that this is not the fate which attends most office buildings, for the care lavished upon most of them is utterly wasted, and ornateness of design, and even beauty of detail is, in a quite general and literal sense, lost art. Mr. Kimball's two great buildings are not

only conspicuous for their size, but are conspicuous because they can be seen and must be seen. No one can view Trinity church without having their attention immediately attracted to the great walls of masonry and glass that now bound its churchyard. In short, they occupy splendid sites and they occupy them in a splendid manner.

But Trinity building has another distinction which is quite as great as its superb situation, and that is that it is a wholly new presentation of the problem of designing a high building. It is a Gothic sky scraper, a building which, if not actually the first of its kind, is so new a version of the Gothic style and so successful a one to boot, that it is likely to give a fresh impetus to the study of Gothic architecture, and lead to new studies in its adaptation to the needs of modern building design.

Whether the close juxtaposition of Trinity building to Trinity church was the reason for choosing the Gothic is immaterial; the Gothic of the building is quite different from the Gothic of the church; yet both are examples of modern Gothic, that of the church being an ecclesiastical Gothic; that of the office building being civic Gothic. The difference between the two is very great, and in this lies the secret of Mr. Kimball's success. The last word of Gothic in modern architecture was supposed to have been enshrined in Mr. Street's Law Courts in London. But Mr. Street failed, and failed disastrously, because he used the forms of ecclesiastical Gothic, used them unthinkingly and without adaptation, strung mediæval turrets upon his walls; lighted his rooms with traceried windows, profoundly pointed; vaulted his corridors and used all the paraphanalia of mediæval Gothic as it was understood by the archæological architects of the Victorian era.

Mr. Kimball's processes have been widely different and his success correspondingly great. Having a commercial building to design, he immediately ignored the forms and the traditions of ecclesiastical Gothic. Attacking the subject from the viewpoint of the Gothic spirit—something quite different from the copying of Gothic forms, which was the rock on which the Victorian Gothicists went to pieces—he designed a modern office building exactly as he imagined a mediæval architect would have done had he had an identical problem presented to him. His design is, therefore, almost completely devoid of the stock materials of Gothic design. It is true there are a couple of pointed gables in the lower cornice; there are smaller similar gables crowning emphasized bays introduced to relieve the design; there are some pointed windows, and four and five centered arches in the lower tiers and in the uppermost member; these give character and emphasis to the design, but do not dominate it.

An examination of the facade overlooking Trinity churchyard will make clear just what has been accomplished. This is the most important aspect of the building, for the frontage of 41 feet 6 inches on Broadway, and of 46 feet 6 inches on Trinity place are too narrow to properly represent the real architectural achievement of this building. It is the churchyard front, with its great length of 264 feet, and its enormous height of 290 feet which counts, and by which the success of the design must be measured. This is a very considerable surface to treat in an architectural manner and in a way that holds the interest throughout, especially in a city with the rigid requirements of the building law prohibiting extensions beyond the building line, and the stern commands of the owners forbidding retreat behind it; yet Mr. Kimball has solved this most difficult problem in a highly interesting and very successful way.

There is an architectural base of four stories, which is emphasized by a central series of two storied rounded windows. Then comes the superstructure of thirteen stories, the uppermost of which is included within the supports of the main cornice immediately above it. All of this great surface is kept perfectly plain and flat, save for two string courses, and the grouping of seven pairs of windows into bays, surmounted with curved and pointed pediments that barely obstruct—and practically do not do so—the windows immediately above them. Then comes the freize of four stories, in which the two storied arches of the base are repeated. The pavilions at the ends, with their shallow curved pediments are, perhaps, the least successful parts of the design; but the problem here was a very difficult one to solve successfully, and the present finish is certainly not objectionable. Of Gothic forms, therefore, there is little enough, but Gothic character is given by the detail, by the traceried windows below, by the Gothic panels and pilasters, by the applied pinnacles to the enclosed bays and by other features of like nature.

As it stands today Trinity building is but part of a more extended scheme which it is hoped to carry into completion; but it is thoroughly complete in every detail, and needs no further extension to give it interest. Its floor space, while restricted, is admirably adapted to the needs of corporations requiring uninterrupted floor area, and the rapid manner in which its offices and floors have been rented are ample testimony to its commercial success.

Gothic having been chosen for the external expression of the building, the same style has been used in the interior. The main corridor, with its marble walls, its gilded ceiling, its great bronze entrance door, with its upper traceried screen of leaded glass, its Gothic elevator enclosures, with their beautiful bronze pediments, and the windows opening onto it, is something entirely new in commercial architecture. And it is not only new but very well done, admirably conceived and beautifully carried out. Narrow as this corridor is, it is, in some senses, the most interesting corridor in New York. It speaks a new note in modern architecture, a note that is modern and new, good and fine. It is a building that will not only greatly enhance the reputation of its designer, but which must greatly extend the application of the Gothic style to modern needs. Apart from its own merits as an example of commercial architecture this is a fact likely to be of supreme importance in modern building.

CONSTRUCTION PROBLEMS, TRINITY BUILDING.

MR. FERREE, in his admirable criticism mentions the fact without enlargement, that the Trinity building is a commercial success. To account for this attention must be directed from the grace and beauty of the architecture to the consideration of the building from the point of its utility as a business structure. The reason for the commercial success lies not so much in its beauty of design as in the fact that the owners have neglected no opportunity to insure the comfort and convenience of their tenants. No detail has been overlooked and nothing left undone. Only those methods, materials, products, appliances and equipments have been used that have a merited reputation as the best of their kind.

From the mass of interesting details of construction a few of the more noteworthy features are selected for mention:

The building is about 41 feet wide on Broadway, widening to about 47 feet on Trinity place with a total depth of about 265 feet. It is 21 stories in height, being about 290 feet from street to roof. Standing as it does on a narrow plot unusually heavy steel work was necessary to give the required stability against wind pressure. The basement of the building is reached by a broad flight of steps from Broadway and is at the level of the street on the Trinity place end. In the sub-basement are the electric lighting, heating and ventilating machinery. Turbine engines will be used for power generation.

The prominence and the location aroused much interest in the work of installing the foundations. The rapid progress made was noted by even the casual observer. The actual time consumed in putting in these foundations has created a record—fifty caissons in fifty days. The weight of this building is approximately 45,000 tons—fifty caissons are distributed so as to carry this great weight to the best advantage. All of these caissons were carried down to bed-rock or a satisfactory hardpan overlaying the bed-rock. Some of the caissons were taken through several feet of hardpan either to rock or a most suitable strata.

THE TRINITY CAISSON FOUNDATIONS,
THE FOUNDATION COMPANY, NEW YORK.

The average depth of sinking below the curb was about eighty feet. Thirty-two of these caissons were rectangular in shape and built of timber. These form an almost unbroken wall around the four sides of the plot. The other eighteen were circular in shape and built of steel. These are in a straight line running through the center of the plot from end to end. These are the deepest foundations for buildings in New York City. Of the eighty feet of depth below the curb all of it below an average depth of about twenty-four feet was through water and quicksand. The water level being about twenty-four feet below the curb, approximately 6,000 cubic yards of material were removed from inside the caissons under air pressure. There was also about 6,000 cubic yards of general excavation in addition to this—a total of near 12,000 cubic yards of material excavated, removed and disposed of. About 5,000 cubic yards of concrete was deposited in filling the caissons from the rock up to the column bases. The abutting streets on three sides of the plot and the adjoining property made the problem of shoring quite as interesting as the foundations themselves. On the north is narrow Thames street with its old buildings but a short distance away. On the south, historic Trinity churchyard running the entire length with the massive gothic gate at the Church street end. On the east busy Broadway with its heavy continuous traffic and the subway running close to the curb line. On the west Church street, surmounted by the Sixth avenue elevated with one supporting post almost opposite the center of the plot. To properly shore all this adjoining property and protect it against damage and settling during the sinking of the fifty caissons neccessitated the most careful and skillful handling and the planning called for the best engineering ability. The difficulty of the shoring was increased through the efforts of the contractors to preserve the sacredness of the church property. A protecting fence was erected the full length of the plot and all work was kept rigidly inside this fence so that no work whatever was done in the churchyard. All timbering and bracing was done from the building side. This entire contract of foundations and shoring was completed without trouble of any kind and the finished foundations were delivered to the general contractor well within the time specified. Such results reflect great credit upon the foundation contractor, The Foundation Company. It is not possible to accomplish such results except with the highest engineering ability to conceive and plan, a well balanced, fully organized force of superintendents, foremen, engineers and men trained to their work to execute and a complete equipment of heavy machinery and tools especially adapted to this class of work and always ready for immediate service. The Foundation Company possesses all of these and are splendidly equipped for heavy foundation work of all kinds—caissons particularly. It might be added here that the sinking of caissons for office building foundations was made possible by the Moran Air Lock which is the invention of Mr. Daniel E. Moran, C. E., who is secretary of The Foundation Company and is associated with Mr. Edwin S. Jarrett, C. E., treasurer, and Mr. Franklin Remington, C. E., president.

The main front and the sides of the building are of blue Bedford stone from the Hoosier quarries of the Bedford Quarries Company, Chicago. Remarkably quick time was made in the stone setting. The first stone was placed August 19, 1904, and the last December 20. This record was made by William Bradley & Son, cut stone contractors, Brooklyn, N. Y.

The integrity of the masonry was assured by the use of Atlas Portland cement.

A long list of great buildings in New York testifies to the ability of John H. Shipway & Brother, importers and manufacturers of interior marble, mosaic and tile work, to execute successfully the largest contracts. Their list of work includes the Trinity building.

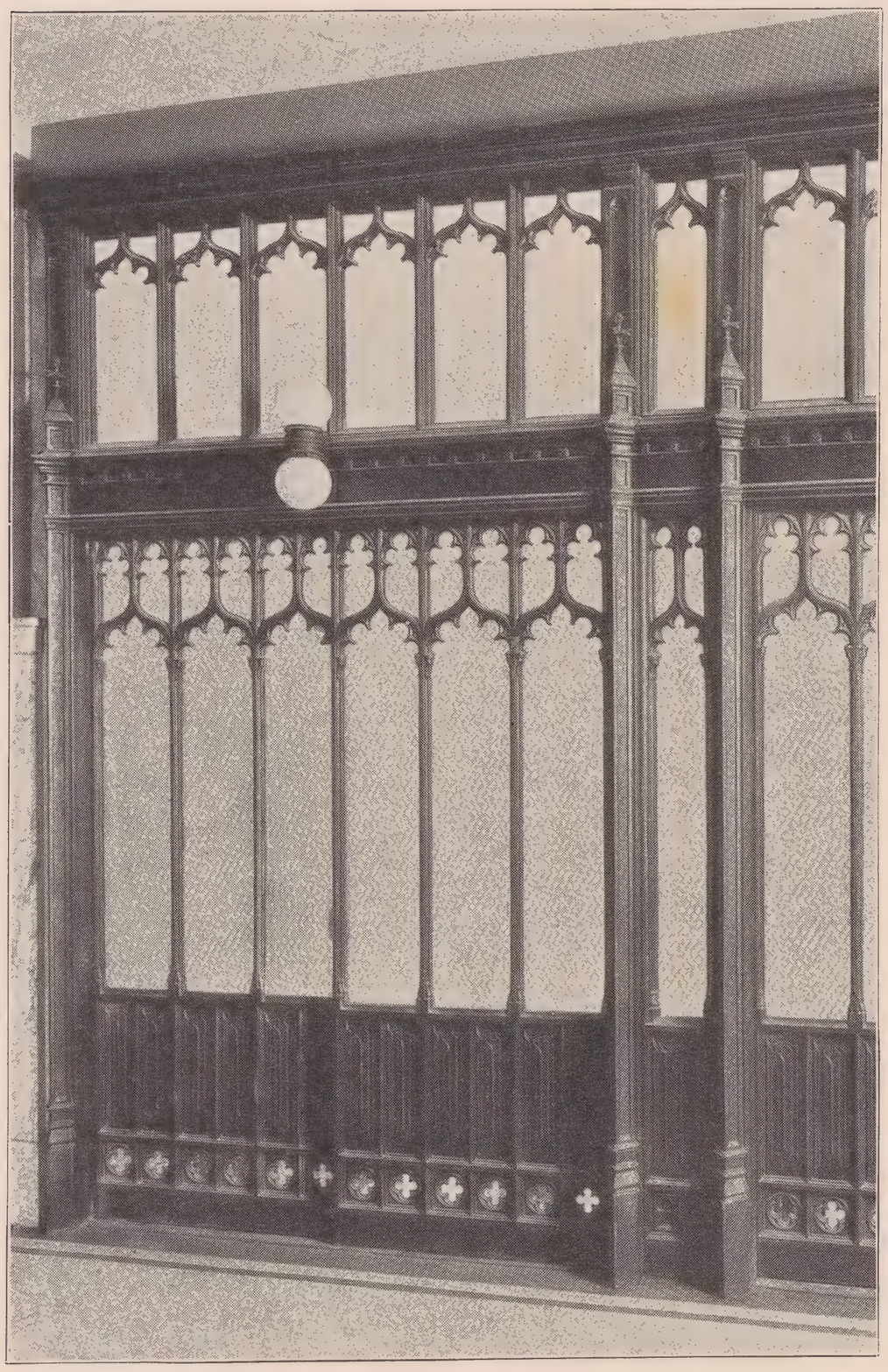
A glance at the plate in the illustration pages, entitled "Vista in the Main Corridor," will indicate the extensive use made of marble in the interior finish. The marble was all carefully selected, and adds great brilliancy and beauty to the interior treatment. All the marble work in the three lower floors was executed by Batterson & Eisele, New York.

The fireproofing of the building is of hollow-tile blocks, both floors and partitions, the floor arches being of

the end construction type. A very interesting feature of the building is the plan and type of elevator service. The elevators are eleven in number and all of the plunger pattern. Ten are used for passenger service; five of these are expresses running to the top of the building and five for local service running to the twelfth floor; the remaining one is used for freight. The pistons on which the elevator cars rest are sunk to a depth of 300 feet. They represent the highest single rise ever achieved by this type of elevator. The elevator equipment was installed by the Standard Plunger Elevator Company, of New York.

As a matter of course, the building is equipped with the mail chute system, installed by the sole makers, the Cutler Manufacturing Company, Rochester, N. Y., and authorized for use in connection with the United States free collection service.

The very elaborate mahogany trim throughout the building has been subjected to a fire retarding process. Two 6-in. stand-pipes are installed in the cut-off staircase hallways, each with a valve and 100 feet of hose and nozzle at each floor level. These stand-pipes are intended to be supplied by fire engines through Siamese connections on the street level.



IRON GRILLEWORK
BY WINSLOW BROS. CO.

WIREGLASS BACKING
BY MISSISSIPPI WIRE GLASS CO.

No other feature of the building is more indicative of its ornate character than the bronze work in the various halls, corridors and elevator openings. All of the ornamental iron and bronze work in the building was executed by Winslow Bros. Company, of Chicago and New York, and is regarded as the most elaborate of any office building in the world.

The building itself is so thoroughly non-combustible that little remained in the matter of fire protection save against the exposure hazard—against fire spreading from floor to floor or fire contributed from buildings at the rear. All stairways are enclosed in hollow tile partitions with tin-clad doors, while elevator shafts are enclosed in grille work backed by Mississippi wire glass as shown in cut herewith. All windows facing on Thames street have Mississippi wire glass in copper frames, those opening into offices having polished glass admitting an unobstructed view. The skylights are wire glass.

In a building of this size the hanging of the windows is an important detail. It is of interest to note that sash chain was selected for this purpose. This was supplied by the original sash chain manufacturers, the Smith & Egge Manufacturing Company, of Bridgeport, Conn.

While the fenestration of the building is of vital importance in the design, and to the welfare of the tenants, the cleaning and care involved is a constant menace to life which has engaged much inventive genius to overcome efficiently. Along this line over 1,600 of the windows in the building are equipped with that very latest appliance for the safety of the operator in cleaning the outside of the windows, the Perfect Safety Window Guard. The owners after careful investigation of all appliances of this nature gave the contract to this company, for the reason that it represented the latest improvements in appliances of this character to be had, combining actual insurance against accident, and economy in time and labor.

The views of the Trinity Building in our illustration pages are from the photographs of George P. Hall & Son, New York, and demonstrate their thorough competency in difficult photography.

ARCHITECTURAL EFFECTS IN BUILDING BLOCKS.

BY A. S. ATKINSON.

NEXT to the question of making strong serviceable building blocks of concrete is that of widening their use for architectural effects by producing greater variety in form, shapes, sizes and finish. The ordinary concrete building block is eminently adapted to construction of buildings in which strength and fireproof qualities are more desirable than anything else, but architects have been less cordial in adopting the blocks for private residences where lines of beauty and effect are particularly demanded. It is true that a solid front or side of a house built entirely of one size of blocks presents a rather monotonous finish, but today there is little reason or justification for such sameness.

The tendency in the manufacture of the concrete building blocks is noteworthy both in the direction of securing better and more durable products and in obtaining more architectural effects. This latter development is worthy of special consideration in view of the widespread demand for some form of low cost fireproof building material for private residences. Fireproof homes in the country and small towns and villages have recently become very popular, and the concrete building blocks have contributed largely toward this movement. But in the effort to combine the useful with the beautiful there have been designed houses of concrete blocks with shingle roofs and wooden trim. The effect of this is somewhat incongruous, for

while variety is obtained in combining the two materials the fireproof qualities of the house are practically nullified.

The concrete manufacturers have come to the rescue by building machines that will make blocks of almost every conceivable shape and size. This variety is rapidly increasing, and it may not be many years before concrete building materials will represent as wide a diversity of effect as anything made of wood. There is no just reason why this should not be accomplished when we consider that in its plastic condition the concrete can be moulded into any shape or form desired. It is simply a question of moulds and of artistic workmen to finish the blocks in any design demanded. There will undoubtedly spring up a class of concrete workmen who will represent in this trade the stone carvers and cutters of the latter trade. Here is just as wide a field for development. Variety will be demanded, and while machines will press the blocks in their desired form it will require hand workers to finish off the faces in particular forms.

This is not altogether a novelty in the trade, for where blocks are made by pouring the concrete into the moulds and leaving the tops exposed it has been customary to finish the face off with a richer mixture of cement and sand, and then trowel the upper surface smooth. In addition to this rollers and tools are now used to produce any artistic effect desired. The tooling of the face of the blocks opens great possibilities for variation, and expert workers can reproduce any form of stone carving.

In addition to this some remarkable effects have been obtained by representing different colored stones with thin coatings of screened stone. The stone is broken into uniform sizes, and while the block is still wet and plastic this is screened over the upper face. The selection of different colored stones for this purpose permits a wide variation in effects. When such surfaces are tooled by hand it is impossible to distinguish the artificial front from natural red, blue or green stone. The screened stone must be applied quickly, and worked in the concrete so that it will adhere firmly to it. In constructing handsome residences of concrete building blocks, the facing of colored stones is entirely under the control of the workmen. There is needed today probably as much as anything proficient cement and concrete workmen who can produce such desirable artistic effects in the blocks, and as the trade develops a distinctly new industry will be created by these workmen. The concrete block machines can not finish off such stones with anything like the variety that is obtained by hand, and as a complement to the machines efficient workmen will be required for facing blocks and corner stones.

The machines themselves have developed rapidly, and they possess a mobility of work that enables the manufacturer or builder to secure a wide variety of shapes and forms. The adjustable nature of the machines makes it possible to adapt the work to the needs of nearly all kinds of building work. The blocks can be made of various lengths, height and thickness by simply adjusting the moulds, and the advantages of such manufacture are very apparent. Blocks for sills, coping and lintels can be turned out with almost equal facility, and the builder can produce changing effects without resorting to hand moulding and tooling. This is quite important when we consider that in an ordinary brick building a dozen different size bricks may be used by the mason to secure a finished effect. The brick builder in recent years has greatly popularized his work by increasing the variety of his materials. With plain faced bricks, glazed, colored and burnt, he has been able to secure variety enough to avoid any monotony of appearance in the walls. Used in combination with stones, even richer effects have been produced.

Now the concrete block builder must compete directly with the brick builder both in regard to price of material and workmanship and artistic effects. A bare plain wall, unrelieved by any change in form or color, may satisfy owners of factories and stores, but the owner of an artistic dwelling demands more variety. It is not sufficient to demonstrate to him that concrete blocks are fireproof, and thus afford more protection to his home and contents. Even when it is shown that the hollow concrete walls are less affected by heat and cold, and almost proof against dampness, he will weigh all these unfavorably against the final question of appearance. If the house is inartistic, and appears like a duplicate of every other house built of the same material, he will hesitate. Consequently, for the best interests of the trade, it is important that the blocks of concrete should represent as wide a variation in form, size, facing and coloring as possible. It is the very fact that this can be accomplished at comparatively little expense, which gives so much promise to the future of the concrete block industry.

The ordinary stone house, with the front chipped and tooled by hand, grows somewhat monotonous unless the different courses of stones vary in width and length. The foundation courses of either stone or concrete blocks should be much larger in size than the upper courses. This sharp distinction between the foundation and the beginning of the walls adds dignity and beauty of outline that is quickly noticeable. The further breaking up of the walls with courses of small stones or concrete briquettes of the size of ordinary bricks just above the first story, and again on the line of the third story, provides variety of outline that is pleasing to the eye.

In factory and mill construction the building blocks have already become well established, but it is in other fields that the building materials should make their reputation. The store, apartment house and private residence, as well as the country barn and farm house, should be converted into fireproof, substantial structures by concrete blocks. Indeed, there is no limit to the application of the blocks, provided care and good judgment are exercised in every direction.

ASPHALTUM AND ITS USES*—Continued.

BY J. S. JACKSON.

The specifications require that the ultimate thickness of burlap and two coats of asphaltum shall be at least ¼-inch, on top of which is laid a course of brick, laid flat, grouted with cement mortar. The city of Cincinnati is spending about $10,000,000 on their new system and is taking every precaution to insure that there shall be no leakage in the reservoirs.

The city of Philadelphia in 1892 completed a large reservoir called the Queen Lane Reservoir, which caused the city great annoyance and expense in the way of leakage. This reservoir was treated with asphaltum in the same manner as set forth in the above mentioned specifications, and there has been no further trouble.

---

*A paper read before the Chicago Architects' Business Association, May 12, 1905.

In the same year the city constructed another large reservoir at Rocksborough, a suburb some twelve miles out. This was built at a cost of some $1,200,000. The slopes and bottom were puddled with eighteen inches of clay, followed on the bottom by six inches of cement concrete, and on the slopes with a lining of vitrified brick laid edgewise in cement mortar. The reservoir was practically worthless, as the leakage was so bad that the city gave up trying to use same until some remedy was effected. In this reservoir the writer had charge of the work in 1896 of putting in an asphalt lining consisting of one and one-half inches of asphalt as laid on the streets. The brick and cement lining was first coated with a solution of benzine and asphalt, being followed by one-eighth inch of pure asphalt, on top of which was laid one and one-half inches of street mixture; this in turn being coated by one-eighth inch of pure asphalt. There has been no trouble since.

Many reservoirs have been completed within the last fifteen years being lined with asphalt alone and being laid directly on the first sub-grade, using a material similar to a street mixture, and then coating the same with pure asphalt mopped on hot. This is an economical and effective lining and answers every purpose, and is very largely used, especially on the Pacific coast.

A desirable feature of the lining is that it is entirely water tight and if there should be any settlement of the earthen slopes or bottoms, the lining will gradually follow any moderate settlement without cracking or breaking and thus insuring against leakage.

The writer has also constructed reservoirs with brick by dipping same in asphalt and laying them in two courses and again coating with pure asphalt.

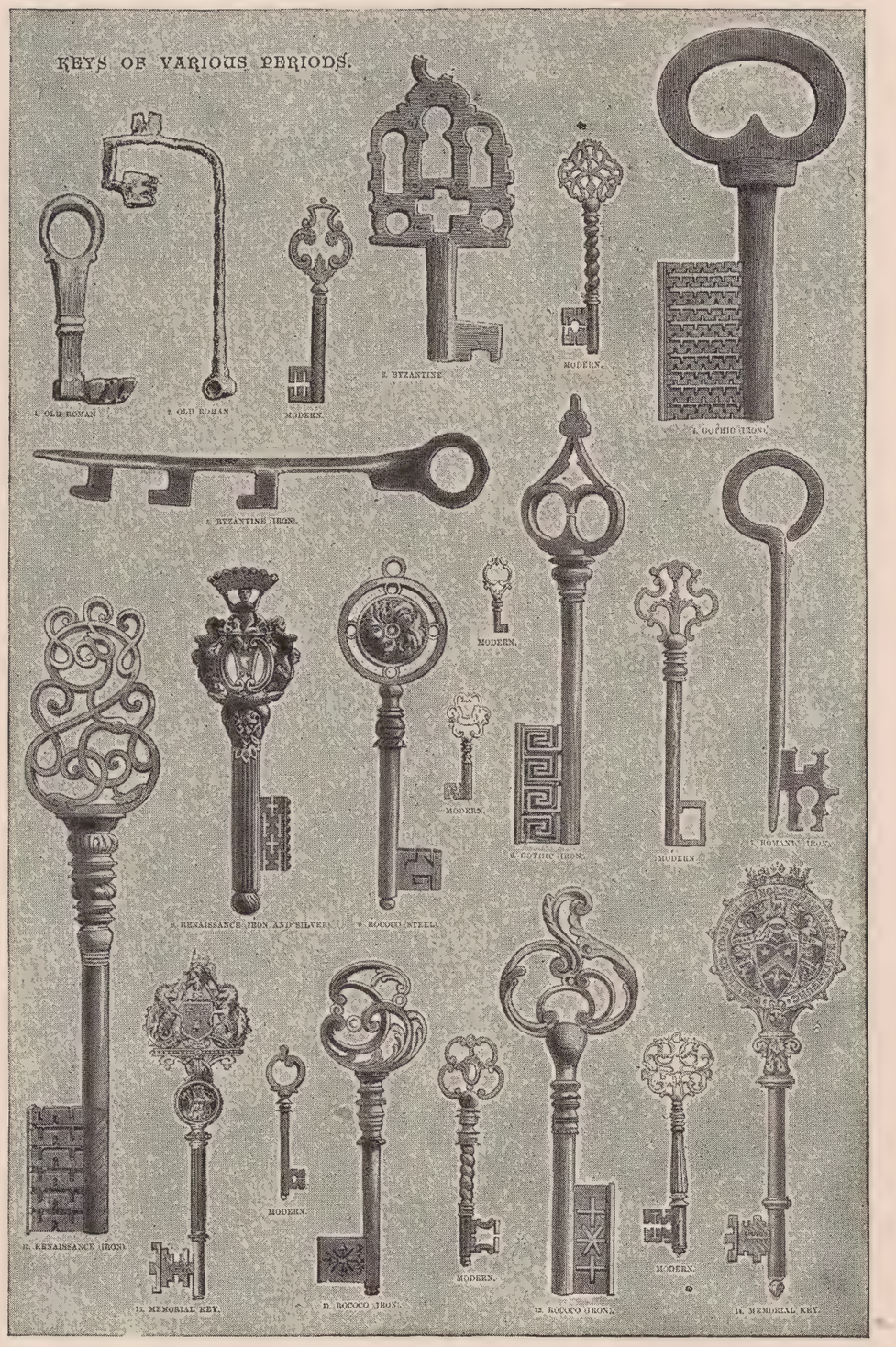
It is unnecessary to go further into this branch of the asphalt industry, as it has been completely demonstrated that for this purpose the material is unequalled.

(To be continued.)

LOCKS AND HARDWARE*—HISTORICAL.

(CONTINUED)

"The ravages that followed the downfall of the Roman Empire gave an unprecedented impulse to lock-making—indeed, to the art of working in iron generally. The danger of being robbed at any time was a keen spur for human ingenuity to improve the means of securing property. Painting on glass is not the only art that the Middle Ages made their own, developed and perfected to a marvelous degree. That of the smith was furthered likewise. For the security of property, locking a door became insufficient. Doors were lined with iron plates or strengthened by iron bars, and even made of iron altogether; locks were applied to any piece of furniture destined to contain valuables, and these, too, were either strengthened by iron network or made of iron. Though the fact has seemingly been overlooked by the historians of safe-making, iron safes began to be built as early as the fifth century of our era. Gregory of Tours, the French Herodotus, relates in his history of France that the Emperor Justinian being dead, Justin II, his successor, full of miserly fears, 'ordered his smith to construct iron coffers to keep there his thousands of goldpieces.' Fredegonde, Queen of France, wishing to revenge herself for some insult she had suffered from her daughter Rigonthe, engaged her to take anything she chose among her mother's jewels, 'which were kept in an immense iron chest,' says the same author. 'While Rigonthe was thus bent over the open coffer, Fredegonde with unparalleled treachery caused the iron lid to fall on her daughter's head, and so she pressed on it with all her weight, that the poor girl's neck, caught between the cover and the rim of the iron box, was nearly severed from her body.'



"During the pagan ages labor had weighed on man as the penalty of a crime. Christianity transformed it into a glory. In the early centuries of the new religion manual labor, accomplished with resignation and courage, rose up to the level of virtue. The Middle Ages made a goldsmith bishop, several smiths archbishops, and a carpenter pope. The saints' calendar of those times is filled with names sanctified by manual labor."

*An article forming part of "A Treatise on Locks and Builders' Hardware," by Henry R, Towne, president of the Yale & Towne Manufacturing Company, and past president of the American Society of Mechanical Engineers. John Wiley & Sons, publishers. Price, $3.00. It is the intention of the publishers of the Inland Architect to publish other selections from this work. The book is profusely illustrated and contains more than 1,100 pages, 4x6½ inches.

**For all mechanical explanations that may be found in this sketch, we are indebted to the kindness of Mr. Frederick Vors.

OUR ILLUSTRATIONS.

Men's Club House at McCormick Harvester Works, Chicago, Jas. Gamble Rogers, Architect.

Fleur de lis Apartments, Sheridan Park, Chicago, Frank V. Newell, Architect.

Residence for W. G. Fricke, Oak Park, Ill., Frank Lloyd Wright, Architect.

Residence for Erasmus Wilson, Los Angeles, Cal., Dennis & Farwell, Architects. The following views are shown: Exterior, Reception Hall, Dining Room.

New High School, Denver, Colo., D. W. Dryden, Architect.

Residence A. C. Allerton, Pasadena, Cal., John Parkinson, Architect.

Residence for Mr. Campbell, Spokane, Wash., Cutter & Malmgren, Architects.

Residence of C. H. Shafer, Los Angeles, Cal., Interior View.

Rogers Park Congregational Church, Chicago, J. E. O. Pridmore, Architect.

The Architecture of the Trinity Office Building, New York City, Francis H. Kimball, Architect, is described in another column by Barr Ferree. The following illustrations of the building appear in this number: General View, Main Facade, Exterior Detail, Upper Corner, Detail of Entrance and Lower Stories, Vista in the Main Corridor, the Elevator Entrances, Treatment of Stairway.

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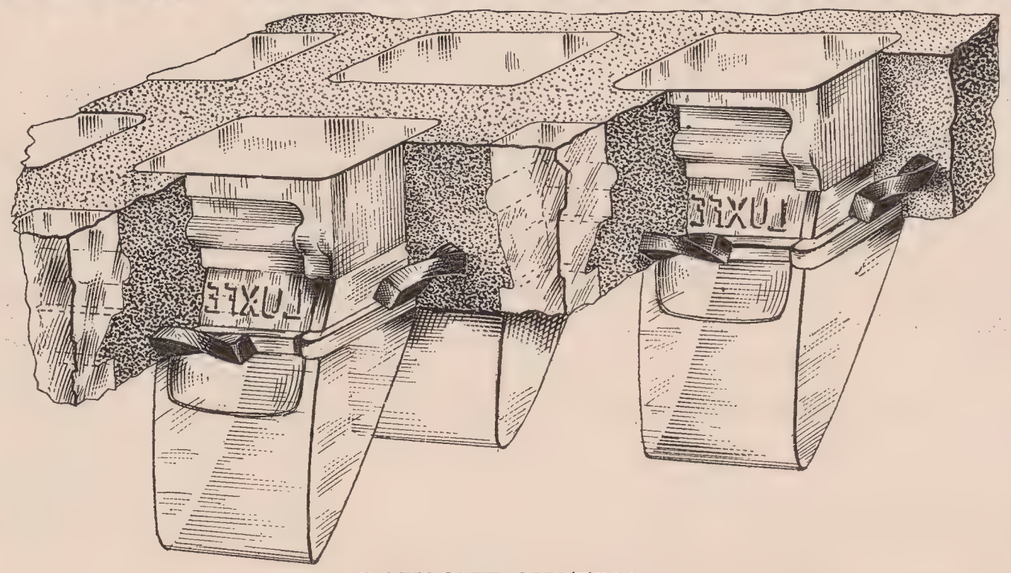

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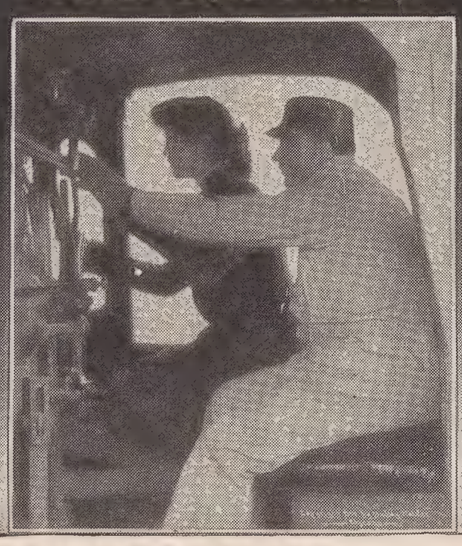

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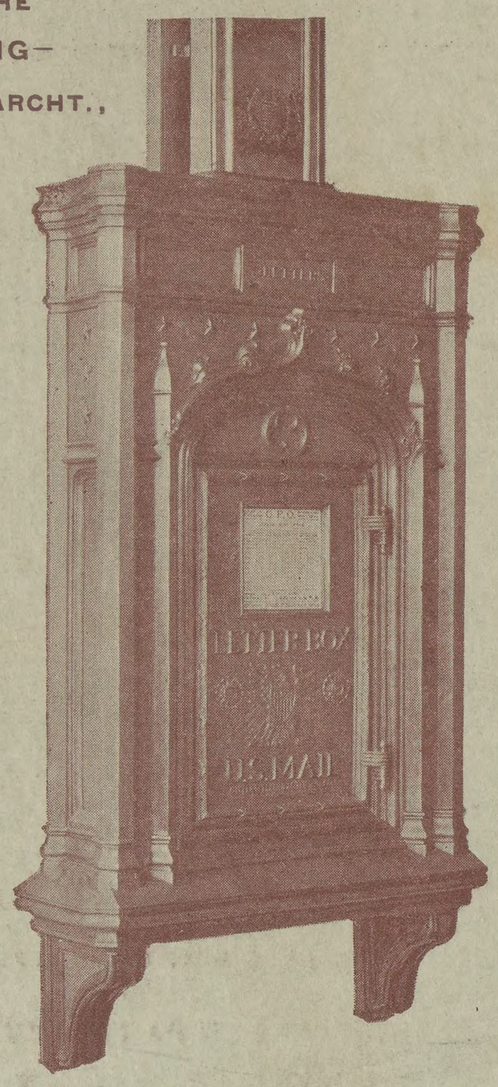

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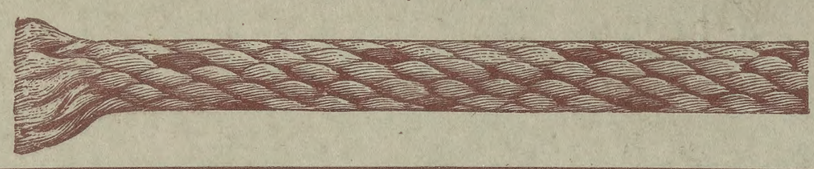

Woodwork Exposed to the Weather

must be protected by an exterior varnish of the best quality or it will soon become white and weather beaten. For permanent satisfaction, specify

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Varnish Makers and Color Grinders
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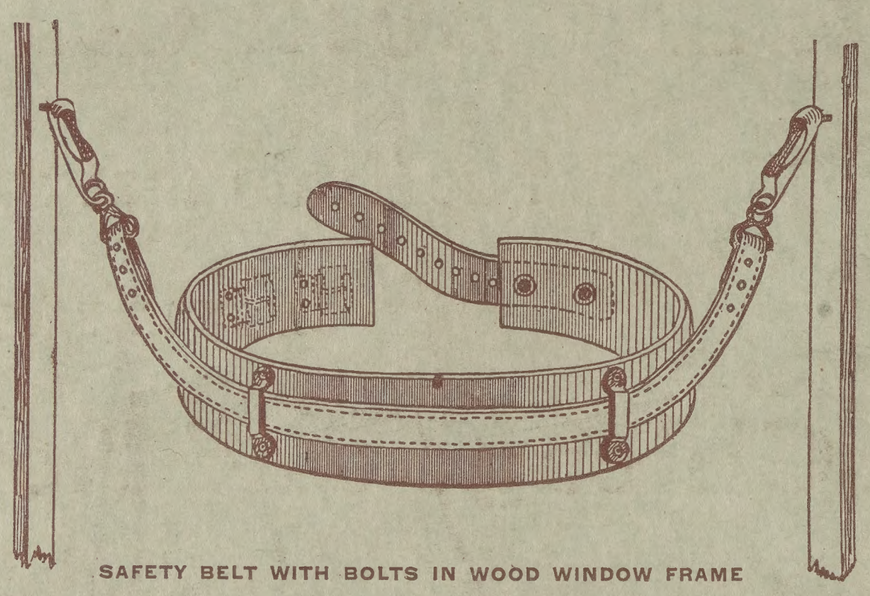

SAFETY BELT WITH BOLTS IN WOOD WINDOW FRAME

SECURITY AGAINST ACCIDENT ON OUTSIDE WINDOW CLEANING

Write for particulars

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J. K. GREEN, General Manager